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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,638	06/25/2003	Dong-seog Han	1349.1217	1052

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EXAMINER	
JOSEPH, JAISON	
ART UNIT	PAPER NUMBER
2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/602,638	HAN ET AL.	
	Examiner	Art Unit	
	Jaison Joseph	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 12/21/2006 have been fully considered but they are not persuasive.

Applicant argue that "Omura discloses...independent claim 1" . However Examiner respectfully disagrees. AAPA disclosed in Figure 2, a linear equalizer for a single carrier receiver comprising a filter unit initializing coefficients of filters and filtering a pre-ghost of the received signal and an error calculation unit calculating an equalization error using an output signal from said filter unit (see figure 2 paragraph 6 – 9). AAPA does not expressly disclose using the channel estimation to initialize the filter coefficients. However in analogous art, Omura et al teach a channel estimation unit estimating channel estimation values using a received signal inputted thereto and a generated field-synchronizing signal and using the channel estimation to initialize the filter coefficients (see figure 5, components 502, 512, 514 and column 7, lines 6 –59). Therefore AAPA in view of Omura teach all the cited limitations. Furthermore AAPA teaches an equalizer used in a single carrier receiver. Omura teaches as applicant admitted filtering the preghost (multipath) signals. Therefore Omura is analogous art. Furthermore Omura teaches using the channel estimation to initialize the filter coefficients. Thus AAPA in view if Omura teach all cited limitations. Therefore Examiner maintains his rejection. Furthermore Applicant is reminded that Examiner is entitled to give broadest reasonable interpretation to the language of the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 – 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) in view of Omura et al, (US Patent 6,559,894).

Regarding claim 1, AAPA disclosed in Figure 2, a linear equalizer for a single carrier receiver comprising a filter unit initializing coefficients of filters and filtering a pre-ghost of the received signal and an error calculation unit calculating an equalization error using an output signal from said filter unit (see paragraph 6 – 9). AAPA does not disclose a channel estimation unit estimating channel estimation values using a received signal inputted thereto and a generated field-synchronizing signal and using the channel estimation to initialize the filter coefficients. However in analogous art, Omura et al teach a channel estimation unit estimating channel estimation values using a received signal inputted thereto and a generated field-synchronizing signal and using the channel estimation to initialize the filter coefficients (see figure 5, components 502, 512, 514 and column 7, lines 6 –59). Therefore it would be obvious to an ordinary skilled in the art at the time the invention was made to incorporate the teachings of using channel estimation to initialize the equalizer in AAPA. The motivation or suggestion to do so is the equalizer will be more stable and can recover quickly after loss of synchronization (see column 3, lines 20 –28).

Regarding claim 2, which inherits the limitations of claim 1, AAPA further teach said filter unit updates the coefficients of the filters according to the equalization error and filters the pre-ghost and post-ghost using the updated coefficients of the filters (see paragraph 4).

Regarding claim 3, which inherits the limitations of claim 1, Omura et al further teach said channel estimation unit includes a correlation cumulation unit calculating an cumulating correlation values between the received signal and the field synchronizing signal; and an estimation decision unit deciding the channel estimation values by applying a predetermined threshold value to the cumulated correlation values (see figure 6, and column 7, lines 17 – 32).

Regarding claim 4, which inherits the limitations of claim 1, AAPA further teach a decision unit deciding a signal level for an output signal from said filter unit, wherein said error calculation unit calculates the equalization error using an input signal to said decision unit and an output signal from said decision unit (see paragraph 7).

Regarding claim 5, which inherits the limitations of claim 1, AAPA further teach error calculation unit calculates the equalization error using the output signal from said decision unit and the field-synchronizing signal (see paragraph 8).

Regarding claim 6, the claimed method including the features corresponds to the subject matter mentioned above in the rejection of claim 1 is applicable hereto.

Regarding claim 7, which inherits the limitations of claim 6, the claimed method including the features corresponds to the subject matter mentioned above in the rejection of claim 3 is applicable hereto.

Regarding claim 8, AAPA teach a decision feedback equalizer comprising a feed forward unit (figure 3, component 342) initializing coefficients of a first filter and filtering a pre-ghost of the received signal, a feedback unit (figure 3, element 43) initializing coefficients of a second filter and filtering a post-ghost of the received signal; and an error calculation unit (figure 3, component 47) calculating an equalization error using output signals from said FF and FB units. AAPA does not disclose a channel estimation unit estimating channel estimation values using a received signal inputted thereto and a generated field-synchronizing signal and using the channel estimation to initialize the filter coefficients. However in analogous art, Omura et al teach a channel estimation unit estimating channel estimation values using a received signal inputted thereto and a generated field-synchronizing signal and using the channel estimation to initialize the filter coefficients (see figure 5, components 502, 512, 514 and column 7, lines 6 –59). Therefore it would be obvious to an ordinary skilled in the art at the time the invention was made to incorporate the teachings of using channel estimation to initialize the equalizer in AAPA. The motivation or suggestion to do so is the equalizer will be more stable and can recover quickly after loss of synchronization (see column 3, lines 20 – 28).

Regarding claim 9, which inherits the limitations of claim 9, AAPA further teach said FF and FB units updates the coefficients of first and second filters, respectively according to the equalization error and filters the pre-ghost and post-ghost using the updated coefficients of the first and second filters (see paragraph 10).

Regarding claim 10, which inherits the limitations of claim 8, Omura et al further teach said channel estimation unit includes a correlation cumulation unit calculating an cumulating correlation values between the received signal and the field synchronizing signal; and an estimation decision unit deciding the channel estimation values by applying a predetermined threshold value to the cumulated correlation values (see figure 6, and column 7, lines 17 – 32).

Regarding claim 11, which inherits the limitations of claim 8, AAPA further teach an adder (see figure 3, adder 44) for adding the output signals from said FF and FB units to output a resulting signal (the output signal from the adder);a decision unit (see figure 3, component 46) deciding a signal level for an output signal from said adder and inputting the resulting signal of the predetermined level of said FB unit, wherein said error calculation unit calculates the equalization error using an input signal to said decision unit and an output signal of the predetermined level from said decision unit (see paragraph 10).

Regarding claim 12, which inherits the limitations of claim 11, AAPA further teach error calculation unit calculates the equalization error using the output signal from said adder and the field-synchronizing signal 9see paragraph 12).

Regarding claim 13, the claimed method including the features corresponds to the subject matter mentioned above in the rejection of claim 8 is applicable hereto.

Regarding claim 14, which inherits the limitations of claim 13, the claimed method including the features corresponds to the subject matter mentioned above in the rejection of claim 10 is applicable hereto.

Regarding claim 15, the claimed method including the features corresponds to the subject matter mentioned above in the rejection of claim 1 is applicable hereto. Furthermore AAPA teach a method of removing multi-path signal from a received signal comprising; inputting the received signal into a filter unit (see figure 2, input signal) generating a field synchronization signal from a generator (see figure 2, field synchronizing signal generator).

Regarding claim 16, which inherits the limitations of claim 15, the claimed method including the features corresponds to the subject matter mentioned above in the rejection of claim 1 is applicable hereto.

Regarding claim 17, which inherits the limitations of claim 15, the claimed method including the features corresponds to the subject matter mentioned above in the rejection of claim 3 is applicable hereto.

Regarding claim 18, which inherits the limitations of claim 15, AAPA further teach determining if a blind mode is selected; outputting a predetermined signal from a decision unit if the blind mode is selected; and selecting the received signal as the first signal and the predetermined signal as the second signal when the blind mode is selected (see paragraph 11).

Regarding claim 19, which inherits the limitations of claim 15, AAPA further teach determining if a training mode is selected and selecting a field synchronizing signal as the first signal and an output signal from a filter having the updated filter coefficients as the second signal when the training mode is selected (see paragraph 12).

Regarding claim 20, the claimed method including the features corresponds to the subject matter mentioned above in the rejection of claim 1 is applicable hereto.

Regarding claim 21, which inherits the limitations of claim 20, the claimed method including the features corresponds to the subject matter mentioned above in the rejection of claim 1 is applicable hereto.

Regarding claim 22, which inherits the limitations of claim 20, AAPA further teach updating the filter coefficients with the equalization error (see paragraph 10).

Regarding claim 23, which inherits the limitations of claim 20, AAPA further teach the filter coefficients having a finite impulse response (see paragraph 10).

Regarding claim 24, which inherits the limitations of claim 20, AAPA further teach the filter coefficients having an infinite impulse response (see paragraph 10).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jaison Joseph whose telephone number is (571) 272-6041. The examiner can normally be reached on M-F 9:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jaison Joseph
03/30/2007

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER